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(54) **MATTRESS TOPPER, OCCUPANT SUPPORT ASSEMBLY AND OCCUPANT SUPPORT SYSTEM WITH THERMOSENSITIVE VAPOR TRANSFER CHARACTERISTICS**

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(58) **Field of Classification Search**
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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2003/0087566 A1* 5/2003 Carlyle et al. 442/59
2007/0032561 A1* 2/2007 Lin et al. 521/131
2010/0175196 A1* 7/2010 Lafleche et al. 5/707
2011/0258778 A1* 10/2011 Brykalski et al. 5/421

OTHER PUBLICATIONS

Jinlian Hu; Shape memory textiles—Chapter 10; Shape memory polymers and textiles; The Textile Institute; Woodhead Publishing Limited, Cambridge, England; 2007.

* cited by examiner

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(57) **ABSTRACT**

A nonintegrated mattress topper comprises a cover at least part of which comprises a fabric having a variable vapor transfer property. When the fabric temperature is within a first range consistent with the presence of an occupant on the mattress the fabric exhibits a first vapor transfer rate sufficiently high that the fabric is permeable to vapor transport across the fabric, and when the fabric temperature is lower than the first temperature range and consistent with the absence of an occupant the fabric exhibits a second vapor transfer rate lower than that of the first vapor transfer rate. Also disclosed is an occupant support assembly comprising a mattress and a nonintegrated topper having the variable vapor transfer property. Also disclosed is an occupant support system comprising a mattress and an integrated topper at least part of which is made of a fabric having the temperature dependent vapor permeability.

15 Claims, 8 Drawing Sheets

